36. (New) The method of claim 35 further including forming an emitter region at the emitter region position after forming the polysilicon structure.

37. (New) The method of claim 35 further including forming an emitter region at the emitter region position after forming the polysilicon structure and before substituting metal.

38. (New) The method of claim 35 wherein the polysilicon structure includes a doped layer and forming the emitter region comprises outdiffusing dopant from the doped layer to the emitter region position.

39. (New) A method of making an emitter contact for an emitter region of a bipolar transistor, the method comprising:

forming a polysilicon structure on over an emitter region position; and

substituting metal for at least a portion of the polysilicon structure to produce a metal contact, the metal contact not serving as contact to a base region of the bipolar transistor.

REMARKS

In response to the Office Action of February 3, 2000, applicant amends claims 1, 12, 18, 20, 23, 24, and 28 and adds claims 32-39. Applicant reserves the right to reassert the subject matter of the original claims in a continuation application and for purposes of establishing ranges of equivalents.

Response to Obviousness Rejections Based on Jerome

The Examiner rejected claims 1-4, 7-11, 20-22 and 28 under 35 U.S.C. § 103(a) as obvious over U.S. Patent 5,436,496 (Jerome). For sake of brevity, applicant distinguishes the claims from Jerome without addressing the propriety of the suggested modification of Jerome or combination of Jerome with other references. Applicant reserves the right to address the proposed modification or combinations.

At the outset, applicant notes that Jerome reports a programmable fuse comprising a bipolar junction transistor with a floating base. An aluminum alloy structure overlies not only a polysilicon emitter contact but also the emitter region and the base region of the transistor.

Jerome further reports that programming the fuse entails melting the aluminum alloy and polysilicon emitter contact such that the aluminum alloy flows through the emitter region to make contact with the base region. See, for example, column 14, line 1 et seq., which states that "At or about 550 C, the eutectic point of the combination, emitter 44 becomes molten. Making an ohmic contact through emitter region 44 from emitter contact 42 to base 30 results when molten aluminum rich silicon flows into the void, shorting the emitter contact to the base." Thus, in essence, Jerome reports a fuse mechanism that drives molten aluminum through the emitter contact and emitter region to a base region.

In contrast, claims 1-11 (as amended) require "forming a polysilicon structure over an emitter region position of a semiconductive substrate, the substrate having a surface at the emitter region position; and substituting metal for at least a portion of the polysilicon structure to produce a metal emitter contact entirely above the surface of the substrate at the emitter region position." In other words, claims 1-11 require the metal emitter contact to reside entirely above the surface of the substrate. Jerome, on the other hand, drives its aluminum alloy through to the base region of its transistor, with the base region below the surface of its silicon substrate. Accordingly, applicant respectfully requests that the rejection of claims 1-11 be withdrawn.

Claims 12-19, 23-27, and 30 also distinguish from Jerome. These claims require some form of diffusion barrier layer on an active region or active region position of a transistor. In contrast, Jerome forms no diffusion barrier on any of its active regions. Moreover, forming such a diffusion barrier, would appear to destroy the intended function of Jerome, which requires molten aluminum alloy to flow through its emitter region. See also, column 11, lines 23-26, where Jerome reports "removal of the barrier metal above the fuse emitter contact," apparently to pave the way for its molten aluminum alloy. Accordingly, applicant respectfully requests that the rejection of claims 12-19, 23-27, and 30 be withdrawn.

Claims 20-22, which also distinguish from Jerome, require "substituting metal for at least a portion of the polysilicon structure to form a metal contact having a lower-most surface overlying the emitter region position of the transistor." Jerome, on the other hand, drives molten aluminum through its emitter region to its underlying base region. Thus, the resulting aluminum contact would appear to have a lower-most surface underlying the emitter region, not overlying it as claims 20-22 require. Accordingly, the rejection of claim 28 should be withdrawn.

Claim 28 requires "substituting metal for at least a portion of the polysilicon emitter contact without shorting the emitter region of the transistor." In contrast, Jerome reports shorting its emitter region to make contact with its base. Accordingly, the rejection of claim 28 should be withdrawn.

Allowable Subject Matter

Claim 24 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims. Accordingly, applicant has recast this subject matter in the form of new claim 32.

CONCLUSION

In view of the amended claims and the highlighted shortcomings of the cited art, particularly Jerome, applicant respectfully request reconsideration and allowance. Moreover, applicant invites the Examiner to call its patent counsel Eduardo Drake at 612-349-9593 to resolve any concerns which may impede allowance. If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

KIE Y. AHN ET AL.

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Date 3 May 2000 By _____
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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Assistant Commissioner of Patents, Washington, D.C. 20231 on **May 3, 2000**.

Eduardo E. Drake _____
Name Signature